

*Amendments*

*In the Claims:*

Please add the following claims 61-70:

61. (New) A functional probe library for determining at least one previously unidentified biological function of a target protein, comprising  
a multiplicity of discrete compounds, said multiplicity made up of a plurality of vitamins, a plurality of coenzymes, a plurality of compounds having amino acid residue functional groups and mimics thereof, a plurality of metal chelators, a plurality of metal ions, a plurality of carbohydrates, a plurality of nucleic acids, a plurality of lipids, a plurality of enzymes, a plurality of steroids, a plurality of amine hormones, a plurality of alkaloids, a plurality of generic drug molecules and a plurality of natural products;

wherein said library has a sufficient diversity of compounds to determine at least one previously unidentified biological function of the target protein when the multiplicity of compounds of the functional probe library are tested for their ability to modify the stability of the target protein and are compared to a list of compounds known to modify the stability of a group of proteins which share biological function.

62. (New) The functional probe library of claim 61, wherein one or more of said compounds are provided in separate wells of a microtiter plate.

63. (New) The functional probe library of claim 62, wherein each discrete compound is provided singly in a microtiter plate well.

64. (New) The functional probe library of claim 62, wherein said separate wells of said microtiter plate each contain from 1  $\mu$ L to 100  $\mu$ L of total solution.

65. (New) The functional probe library of claim 62, wherein said microtiter plate has 96 wells.

66. (New) The functional probe library of claim 62, wherein said microtiter plate has 384 wells.

67. (New) The functional probe library of claim 62, wherein said microtiter plate has 864 wells.

68. (New) The functional probe library of claim 62, wherein said microtiter plate has 1536 wells.

69. (New) The functional probe library of claim 62, wherein said microtiter plate is a polypropylene plate.

70. (New) An apparatus for determining at least one previously unidentified biological function of a target protein comprising:

a first heat conducting block in contact with a first plurality of samples provided in separate wells of a microtiter plate, each of said samples comprising said target protein and one or more of a multiplicity of discrete compounds from a functional probe library;

a temperature controller coupled to said first heat conducting block;

a light source disposed adjacent to said first heat conducting block;

a fluorescence emission sensor disposed adjacent to said first heat conducting block; and

means for processing a spectral emission signal obtained from said fluorescence emission sensor;

wherein the multiplicity of discrete compounds from the functional probe library is made up of a plurality of vitamins, a plurality of coenzymes, a plurality of compounds having amino acid residue functional groups and mimics thereof, a plurality of metal chelators, a plurality of metal ions, a plurality of carbohydrates, a plurality of nucleic acids, a plurality of lipids, a plurality of enzymes, a plurality of steroids, a plurality of amine hormones, a plurality of alkaloids, a plurality of generic drug molecules and a plurality of natural products; and

wherein said functional probe library has a sufficient diversity of compounds to determine at least one previously unidentified biological function of the target protein when the multiplicity of compounds from the functional probe library are tested using said apparatus for their ability to shift the thermal unfolding curve of the target protein and are compared to a list of compounds known to modify the stability of a group of proteins which share biological function.

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